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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,797	01/18/2002	Kazuichi Isaka	111697	9586
25944	7590	10/18/2005		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER NAFF, DAVID M	
			ART UNIT	PAPER NUMBER
			1651	

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/050,797	Applicant(s) ISAKA ET AL.	
	Examiner David M. Naff	Art Unit 1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9, 11, 15, 19 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9, 11, 15, 19 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/29/05</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for
5 continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/29/05 has been entered.

An amendment filed with the submission amended the specification,
10 and canceled claims 10, 13, 17, 21, 23, 26 and 27.

Claims examined on the merits are 9, 11, 15, 19 and 25, which are all claims in the application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

15 ***Claim Rejections - 35 USC § 103***

Claims 9, 11, 15, 19 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sumino et al in view of Gutttag (3,860,490).

The claims are drawn to a method of producing a microorganism-immobilized carrier for removing an exogenous endocrine-disrupting
20 chemical in water by mixing microorganism with a hydrophilic prepolymer containing a hydrophilic group and a hydrophobic prepolymer containing a hydrophobic group in an amount of 1-40% of the total weight of hydrophilic and hydrophobic prepolymer, and polymerizing. Also claimed is the resultant microorganism-immobilized carrier

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(claims 11), and methods (claims 15 and 19) of removing an exogenous endocrine-disrupting chemical in water.

Sumino et al disclose mixing a microorganism with an oligomer and polymerizing the oligomer to form a gel that inclusively entraps the microorganism (col 3, lines 17-20, col 5, lines 56-61 and col 8, line 2). The gel containing the entrapped microorganism is used in decomposing endocrine disrupter related compounds (col 1, lines 54-60) such as bisphenol A (paragraph bridging cols 7 and 8, and col 8, lines 35-43). The gel containing the microorganism is put in a reaction vessel (col 9, line 15 and col 10, line 31), and waste water containing an endocrine disrupter related compound is contacted with the gel. The oligomer contains a main structure with polymeric double bonds at both ends, and a sub-structure arranged between the main structure and the polymeric double bonds containing a urethane bond and an ethyleneoxy, or a urethane bond and an ethyleneoxy and a propyleneoxy (col 2, lines 16-23). The urethane bond has hydrophobicity and results in a gel that is flexible and has increased strength and erosion resistance (col 4, lines 37-43). The main structure is composed of a polyalkylene glycol that is a block copolymer formed by co-polymerizing a hydrophilic ethyleneoxy monomer with a hydrophobic propyleneoxy monomer (col 4, lines 25-30). The ratio of propyleneoxy is smaller than that of ethyleneoxy (col 4, lines 54-56). The ethyleneoxy has affinity for the microorganism (col 4, lines 15-17). Sumino et al also disclose a comparative example (col 9, lines 60-64) using a conventional ethyleneoxy oligomer which

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is a derivative of polyethylene glycol containing an acryloyl group or a metacryloyl group on each end.

Gutttag disclose immobilizing a microorganism by polymerizing a mixture containing monomers and the microorganism (col 5, lines 50-5 60). Monomers present may be hydrophilic monomers (paragraph bridging cols 2 and 3) and monomers which are hydrophobic (col 3, lines 34-36) to produce a copolymer containing the microorganism entrapped therein.

When carrying out the comparative example of Sumino et al, it would have been obvious to co-polymerize the polyethylene glycol derivative which is hydrophilic with a polypropylene glycol derivative containing an acryloyl group or a metacryloyl group on each end which is hydrophobic to prevent the microorganism from decomposing a gel made of only the polyethylene glycol derivative as suggested by Sumino et al disclosing forming a block copolymer of hydrophilic ethyleneoxy and hydrophobic propyleneoxy to prevent the microorganism from decomposing the gel when only ethyleneoxy is present (col 4, lines 15-22), and as suggested by Gutttag disclosing polymerizing a mixture containing a hydrophilic monomer, a hydrophobic monomer and a microorganism to produce a copolymer entrapping a microorganism.

Omitting the urethane bond disclosed by Sumino et al would have been obvious for reasons set forth above. Since Sumino et al suggest that the amount of propyleneoxy should be less than the amount of ethyleneoxy (col 4, lines 54-56), it would have been obvious to use an amount of hydrophobic pre-polymer within the range of claim 9. Sumino et al use the entrapped microorganism from the comparative example in

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the same way as the entrapped microorganism from polymerizing the oligomer of the invention, and when carrying out the modification set forth above, it would have been obvious to use the entrapped microorganism to remove an exogenous endocrine-disrupting chemical from water as in present claims 15 and 19.

Response to Arguments

Applicant's arguments filed 7/29/05 have been fully considered but they are not persuasive.

Applicants have submitted a Statement Regarding Joint Research Agreement that was in effect before the date of Sumino et al, and urge that Sumino et al cannot be used as a reference. However, this statement is not in the form of a 131 Declaration signed by all of the inventors of the present invention. Moreover, the joint research agreement does not appear to establish priority of invention since the inventive entity of the Sumino et al is different from that of the present invention. A joint research agreement does not necessitate that all parties to the agreement are inventors. The priority application 18861 filed 1/26/01 cannot be used as evidence of prior invention since its date is after Sumino et al and it contains an inventive entity that is not the inventive entity of Sumino et al.

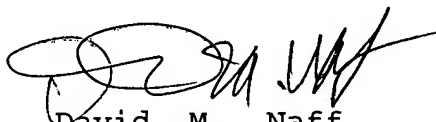
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 571-272-0920. The examiner can normally be reached on Monday-Friday 9:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 751-273-8300.

5 Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For
10 more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


David M. Naff
Primary Examiner
Art Unit 1651

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DMN
10/17/05